REMARKS

Claims 1-5, 11-13, 15, 16, 19 and 25-30 are pending in this application. By this Amendment, claim 28 is amended. The amendments introduce no new matter because they are made to overcome an informality enumerated in the Office Action. Reconsideration of the application based on the above amendments and the following remarks is respectfully requested.

Entry of the amendments is proper under 37 CFR §1.116 since the amendments: (a) place the application in condition for allowance for the reasons discussed below; (b) do not raise any new issue requiring further search and/or consideration as the amendments amplify issues previously discussed throughout prosecution; (c) satisfy a requirement of form asserted in the previous Office Action; and (d) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to correct a matter of form asserted in the Final Rejection. Entry of the amendments is thus respectfully requested.

The Office Action, in paragraph 1, alleges that Applicant's Amendment filed August 9, 2006 introduced new matter into the disclosure. Specifically, the Office Action asserts that the Amendment adds material not supported by the disclosure by reciting in certain claims "controlling to adjust" and "adjusting ... by controlling" instead of "is controlled ... [by driving]." The Office Action improperly asserts that the new recitation lacks basis in the original disclosure. Further, in paragraphs 2 and 3, all of the pending claims are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Applicant respectfully traverses both the objection to the Amendment, and the rejection of the pending claims under 35 U.S.C. §112, first paragraph, based on the following.

The language asserted to be new matter is properly supported in Applicant's disclosure at least at paragraphs [0015] and [0027] where the disclosure, as originally filed, states "if the

first semiconductor layer group and the second semiconductor layer group are controlled appropriately to adjust the amount of the electrons and the holes to be injected into the active layer, the excitation in the active layer can be controlled." Further, with respect to the use of the terms constituting, for example, claim 16, Applicant's disclosure at least in paragraph [0021] states "[i] n b semi conductor layered route 20, the p-type base layer 13, the active layer 14 and the n-type layer 15 constitute a p injunction type semi-conductor laser. The n-type emitter layer 12, the p-type base layer 13, the active layer 14 and the n-type base layer 15 constitute a first semi-conductor layer group functioning as an npn-type bipolar transistor. The p-type base layer 13, the active layer 14, the n-type base layer and the p-type emitter layer 16 constitute a second semi-conductor layer group functioning as a pnp-type bipolar transistor. As such, the objection in the Office Action to Applicant's August 9, 2006 Amendment is improper because the amended claim language specifically objected to in the Office Action clearly finds support in Applicant's disclosure, as originally filed.

Further, apparently referring to the same language amended into claim 1, the Office Action improperly rejects all of the pending claims under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. MPEP §2163 paraphrases the §112, first paragraph, requirement stating "[t]o satisfy the written description requirement a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention." To satisfy this requirement, the MPEP section goes on to state that "an applicant shows possession of the claimed invention by describing the claimed invention with all of the limitations using such descriptive means as words, structures, figures, diagrams and formulas that would fully set forth the claimed invention."

There is no requirement that the language of the claim be identical, and/or verbatim, to the language in the written description. In other words, the exact wording is not required.

The Office Action appears to be attempting to assert such a requirement. The totality of Applicant's disclosure describes the subject matter of the pending claims in such a way that one of ordinary skill in the art would clearly understand that Applicant was in possession of the claimed subject matter at the time of filing the application. The Federal Circuit, in *In re Wright*, 866 F.2d 422, 424, 9 USPQ2d 1649, 1650 (Fed. Cir. 1989), quoted extensive judicial precedent for the proposition that the specification, as originally filed, must convey clearly to those skilled in the art the information that the Applicant has invented in the specific subject matter claim and, when the original specification accomplishes that, regardless of how it accomplishes it, the essential goal of the description requirement is realized.

For at least the reasons indicated above, Applicant's amendments to the claims introduced in the August 9 Amendment do not introduce new matter, and amply meet the written description requirement, based on the standard discussed in the MPEP, and the additionally-cited references to judicial precedent discussed above.

Accordingly, reconsideration and withdrawal of the objection to the August 9 Amendment and the rejection of the pending claims under 35 U.S.C. §112, first paragraph, are respectfully requested.

The Office Action, in paragraph 4, rejects claim 28 under 35 U.S.C. §112, second paragraph, as being indefinite. Claim 28 is amended to obviate the rejection.

Accordingly, reconsideration and withdrawal of the rejection of claim 28 under 35 U.S.C. §112, second paragraph, as being indefinite are respectfully requested.

The Office Action, further in paragraph 4, apparently rejects claims 1-5, 11-13, 15, 16, 19 and 25-33 under 35 U.S.C. §112, second paragraph, as being indefinite. The Office Action improperly asserts that certain features recited in the pending claims lack proper antecedent basis. The Applicant is permitted to act as his own lexicographer. As such, and in an attempt to ensure that the claims are not rendered somehow indefinite or ambiguous by

being overly wordy, the Applicant is amply permitted to define a collection of terms by a single collective identifier. In this regard, reciting that a collection of layers function as a first bipolar transistor in a manner that one of ordinary skill in the art would correctly interpret permits the Applicant to then refer to that collection of features as the first bipolar transistor, as positively recited in the pending claims. There is no basis in law or the rules for the assertion that the Office Action makes in the portion of paragraph 4 which apparently rejects the enumerated pending claims under 35 U.S.C. §112, second paragraph, as being indefinite.

Accordingly, reconsideration and withdrawal of the rejections of claim 28, and separately the apparent rejection of claims 1-5, 11-13, 15, 16, 19 and 25-30 under 35 U.S.C. §112, second paragraph, are respectfully requested.

Should any of the above objections to, or rejections of, any language specifically recited in the pending claims be maintained, Applicant respectively requests (1) precise citation to where in the rules and the law the Examiner believes that his position in any regard is supported; and (2) specific review of that position by a Supervisory Patent Examiner. Applicant believes that each of the objections and rejections, as noted above, are improper.

The Office Action, in paragraph 5, rejects claims 1-24 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,677,552 to Ogura. Applicant notes that the reference to claims 1-24 is incorrect. Applicant believes that the reference to claims 1-24 in paragraph 5 of the Office Action is intended to refer to claims 1-5, 11-13, 15, 16, 19 and 25-30, in other words, all of the pending claims in this application. The rejection is respectfully traversed.

Ogura teaches a thyristor laser. Specifically, for example, at col. 3, lines 14-26, Ogura states "an element of the pnpn structure exhibits the characteristics of a thyristor when a forward voltage is applied to the p and n electrodes on the opposite ends of the semiconductor element. In particular, an element of pnpn structure remains in a high-resistance condition in which no current flows through it when the applied forward voltage is lower than a threshold

voltage, but when the applied forward voltage exceeds the threshold voltage, the element switches into a low-resistance condition in which current flows through it. This switching also takes place when light is introduced into the element while the applied forward voltage is lower than the threshold voltage." A thyristor laser turns the flow of electrons or holes On and Off only. It cannot adjust an amount of electrons or holes. Such functioning is described in detail in the paragraph beginning in col. 3, line 47 and col. 4, line 60. These paragraphs in Ogura teach only turning a transistor On or Off by three electrodes, in other words, controlling whether to flow, or stop the flow, of electrons or holes by three electrodes. Ogura specifically states that "since the threshold voltage of the pnpn element drops by supplying current to the element from the gate electrode, if the bipolar transistor is caused to act as a phototransistor into which light is introduced and the phototransistor is connected to the gate electrode to supply current to the phototransistor, the threshold voltage of the pnpn element can be controlled by means of the intensity of the light introduced into the phototransistor. As such, the On/Off threshold in Ogura can be adjusted by adjusting the intensity of light, but Ogura does not disclose, nor can it reasonably be considered to have suggested, that it is possible to adjust the amount of electrons or holes.

Claim 1 recites, among other features, wherein the successively formed n-type emitter layer, the p-type base layer, the active layer, and the n-type base layer constitute a first semiconductor layer group which functions as a first bipolar transistor, and the first bipolar transistor is controlled to adjust an amount of electrons to be injected into the active layer,

and wherein the successively formed p-type base layer, the active layer, the n-type base layer and the p-type emitter layer constitute a second semiconductor layer group which functions as a second bipolar transistor, and the second bipolar transistor is controlled to adjust an amount of holes to be injected into the active layer,

and wherein by controlling at least one of said amount of electrons and said amount of holes to be injected into said active layer, an intensity of light generated and oscillated is modulated. Claim 16 recites similar features. Ogura fails to disclose or suggest these features.

The Office Action in the third full paragraph on page 4, improperly asserts that controlling the amount of holes or electrons, or both, to be injected into the active layer in the device disclosed in Ogura will modulate the intensity of light generated and oscillated for example, by turning On and Off the device disclosed in Ogura.

First, this statement in itself incorrectly discusses what Ogura does. Ogura does not control an amount of holes or electrons, or both, to be injected into an active layer. Although the semiconductor structure positively recited in the pending claims may be limitedly similar to that disclosed in Ogura, proper construction must be given to each of the positively recited claim features. At a minimum, Ogura fails to teach, or even to have suggested, that the disclosed pnpn semiconductor structure and thyristor laser control technique using that structure can reasonably be considered to teach, or to have suggested, the laser control technique positively recited in the pending claims. "Controlling the amount of holes or electrons" is not at all disclosed in the thyristor laser control technique of Ogura. Nor can such a feature be inferred from the disclosure of Ogura.

Second, Ogura states that with the use of a substrate on which identical device structures are provided a thyristor laser and a driver circuit can be formed together on the substrate and four electrodes are used for locating and connecting different kinds of elements on a surface of the substrate. Though the laser element of Ogura has four electrodes, each of which has a circuit configuration for connection (see Fig. 4), only three of the electrodes at most are used at one time for the on/off operation of the laser, because only three are required to operate a transistor (col. 4, line 60 - col. 5, line 8). Four electrodes could forcibly be used

in Ogura to simultaneously turn on and off the laser. Ogura does not even conceive such a technique, and to attempt to infer from any disclosure of Ogura that such technique is implied, and/or inherent, requires specifically discounting portions of the disclosure of Ogura as a whole for what it can reasonably be considered to teach.

Third, based on the totally different methodologies as discussed above, it is not as simple a matter as the Office Action suggests to merely lump together a method for oscillating a semiconductor laser as is positively recited in claim 16 with a semiconductor laser structure, finding that simply based on some similarity in structure, the method of control is anticipated. For the totality of the reasons discussed above, the specific rejection of claim 16, for example, set forth on page 5 of the Office Action is not correct. The Office Action appears to state that the reason for rejection is based on a control technique which is clearly not disclosed in Ogura.

As stated above, but as is necessary to reiterate here, Ogura's laser is a common thyristor laser, having no other function for controlling an applied voltage except a power supply voltage applied to both ends, wherein the driver circuit becomes a mere switch independent of the laser and for introducing and drawing out a current. The driver circuit has no function of directly controlling a potential across the device of Ogura. Further, Ogura does not disclose at all replacing the driver circuit for the purpose of potential control of each layer.

Lastly, such control would be impossible given the circuit shown in Figs. 3 and 4 of Ogura. In response to Applicant's previously having set forth arguments such as are discussed above, in perhaps less detail, the Office Action in the Response to Applicant's Arguments set forth in paragraph 6 does not accurately or completely address Applicant's arguments. As noted above, while Fig. 4 of Ogura may show four electrodes in the disclosed structure, for example, all four electrodes are not used at the same time.

Additionally, in rejecting, for example, claims 29 and 30, and in specific rebuttal to Applicant's arguments made previously regarding the "Gunn-effect," it is not as simple a matter that simply because Ogura discloses a GaAs layer allowing traveling electrons to be inserted between the active layer and the p-type base layer that Ogura can generate a Gunn-effect. This completely misrepresents any disclosure that can reasonably be construed from Ogura. One of ordinary skill in the art would clearly recognize that Ogura requires a thyristor having a low threshold voltage for switching in order to switch rapidly. The redundantly inserted GaAs layer suggested by the Office Action would severely impact performance of the thyristor laser. It is virtually impossible for a thyristor laser to apply an electric field strong enough to cause a Gunn-effect since in the On state in which a laser is oscillated, the element has low resistance and the value of the current should, therefore, be restrained, so that the element will not be severely impacted. A voltage high enough to cause a Gunn-effect cannot be applied. Therefore, inserting a GaAs layer in Ogura would likely change the principle of operation of the invention disclosed in Ogura to no apparent reason that would be obvious to one of ordinary skill in the art.

In summary, the Office Action improperly overly broadly construes the disclosure of Ogura for anything that it can reasonably be considered to teach, or even to have suggested, regarding the subject matter of the pending claims. The Office Action errs in its construction of Applicant's claims, and apparently disregards certain of the features positively recited in the claims, assuming that the conclusions drawn in the Office Action regarding new matter and/or failure to meet the written description requirement are proper which, as noted above, they are not.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-5, 11-13, 15, 16, 19 and 25-30 under 35 U.S.C. §102(b) as being anticipated by Ogura are respectfully requested.

In view of the foregoing, Applicant respectfully submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-5, 11-13, 15, 16, 19 and 25-30 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number set forth below.

Respectfully submitted,

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JAO:DAT/lmf

Attachment:
Petition for Extension of Time

Date: March 5, 2007

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